```
(%i1)  load(vector);
```

(%o1) $/usr/share/maxima/5.34.1/share/vector/vector.mac$

```
(%i2)  load(eigen);
```

(%o2) $/usr/share/maxima/5.34.1/share/matrix/eigen.mac$

```
(%i3)  X: entermatrix(6, 4);
```

$Row1Column1 : cos(0); Row1Column2 : sqrt(1/2)*cos(atan(1)*1); Row1Column3 : sqrt(1/4)*cos(atan(1)*2); Row1Column4 : sqrt(1/8)*cos(atan(1)*3); Row2Column1 : sin(0); Row2Column2 : sqrt(1/2)*sin(atan(1)*1); Row2Column3 : sqrt(1/4)*sin(atan(1)*2); Row2Column4 : sqrt(1/8)*sin(atan(1)*3); Row3Column1 : cos(0); Row3Column2 : (1/2)*cos(atan(2)*1); Row3Column3 : (1/4)*cos(atan(2)*2); Row3Column4 : (1/8)*cos(atan(2)*3); Row4Column1 : sin(0); Row4Column2 : (1/2)*sin(atan(2)*1); Row4Column3 : (1/4)*sin(atan(2)*2); Row4Column4 : (1/8)*sin(atan(2)*3); Row5Column1 : cos(0); Row5Column2 : (1/4)*cos(atan(4)*1); Row5Column3 : (1/16)*cos(atan(4)*2); Row5Column4 : (1/64)*cos(atan(4)*3); Row6Column1 : sin(0); Row6Column2 : (1/4)*sin(atan(4)*1); Row6Column3 : (1/16)*sin(atan(4)*2); Row6Column4 : (1/64)*sin(atan(4)*3); Matrixentered.$

(%o3)
$$\begin{pmatrix} 1 & \frac{1}{2} & 0 & -\frac{1}{4} \\ 0 & \frac{1}{2} & \frac{1}{2} & \frac{1}{4} \\ 1 & \frac{1}{2\sqrt{5}} & \frac{\cos(2\,\mathrm{atan}(2))}{4} & \frac{\cos(3\,\mathrm{atan}(2))}{8} \\ 0 & \frac{1}{\sqrt{5}} & \frac{\sin(2\,\mathrm{atan}(2))}{4} & \frac{\sin(3\,\mathrm{atan}(2))}{8} \\ 1 & \frac{1}{4\sqrt{17}} & \frac{\cos(2\,\mathrm{atan}(4))}{16} & \frac{\cos(3\,\mathrm{atan}(4))}{64} \\ 0 & \frac{1}{\sqrt{17}} & \frac{\sin(2\,\mathrm{atan}(4))}{16} & \frac{\sin(3\,\mathrm{atan}(4))}{64} \end{pmatrix}$$

```
(%i4)  numer: true;
```

(%o4) $true$

```
(%i5)  XTXi: expand(invert(transpose(X).X));
```

(%o5)
$$\begin{pmatrix} 1.210732377431381 & -3.500779187235873 & 5.677922170884123 & -3.332974405901475 \\ -3.500779187235873 & 18.81931191150853 & -33.44634046059017 & 28.9937008520209 \\ 5.677922170884119 & -33.44634046059017 & 65.5623660460402 & -59.05723476576064 \\ -3.332974405901472 & 28.99370085202089 & -59.05723476576065 & 64.81634450219492 \end{pmatrix}$$

```
(%i6)  XT: expand(transpose(X));
```

(%o6)
$$\begin{pmatrix} 1 & 0 & 1 & 0 & 1 & \\ 0.5 & 0.5 & 0.2236067977499789 & 0.4472135954999579 & 0.06063390625908324 & 0.242535 \\ 0 & 0.5 & -0.1499999999999999 & 0.2 & -0.0551470588235294 2 & 0.0294117 \\ -0.25 & 0.25 & -0.1229837387624884 & -0.02236067977499786 & -0.01047718233153276 & -0.011591 \end{pmatrix}$$

(%i7)
```
Ideal: [0, 1, 0, 1, 0, 1];
```

(%o7) $[0, 1, 0, 1, 0, 1]$

(%i8)
```
Multipliers: expand(XTXi.XT.Ideal);
```

(%o8)
$$\begin{pmatrix} -0.7435870134608791 \\ 4.25812532080739 \\ -4.729966905095337 \\ 5.421603202609914 \end{pmatrix}$$

(%i9)
```
Results: expand(X.Multipliers);
```

(%o9)
$$\begin{pmatrix} 0.03007484629033752 \\ 1.119480008508505 \\ 0.2512847577636152 \\ 0.8370674207079541 \\ -0.2813596040539411 \\ 0.8307844015344149 \end{pmatrix}$$